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Shear Localization and Microstructure in Coarse Grained Beta Titanium Alloy

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Abstract

Adiabatic shear localization plays an important role in the deformation and failure of the coarse grained beta titanium alloy Ti - 5 Al - 5 Mo - 5 V - 1 Cr - 1 Fe with grain size about 1 mm at high strain rate deformation. Hat shaped specimens with different nominal shear strains are used to induce the formation of shear bands under the controlled shock-loading experiments. The true stress in the specimens can reach about 1040 MPa where the strain is about 1.83. The whole shear localization process lasts about 35 microseconds. The microstructures within the shear band are investigated by optical microscopy, scanning electron microscopy / electron backscatter diffraction, and transmission electron microscopy. The results show that the width of the shear bands decreases with increasing nominal shear strain, and the

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